

Applicant: Peter Silverman
Serial No.: 10/665,416
Filed: September 18, 2003
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Attorney's Docket No.: 10559-870001 / P17318

REMARKS

Claims 1-29 are pending, with claims 1, 10, 21 and 27 being independent. Claims 1-9 and 21-16 have been withdrawn by the Office. Claims 10, 14, 16 and 27 have been amended. Claim 15 has been cancelled. No new matter has been added.

Rejections Under 35 U.S.C. § 102(e)

Claims 10-13 and 17-20 stand rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by U.S. Patent Application No. 6,756,163 to Yan ("Yan '163").

Yan '163 teaches a mask blank having a "re-usable coating" that includes "a multilayer (ML) reflector 310, an inner capping layer 320, a ML stack 330, and an outer capping layer 340" (see, Yan '163 at col. 3, ll. 6-10; FIG. 3). In Yan '163, the ML reflector 310 is on top of the substrate, and the inner capping layer 320 is on top of and in contact with the ML reflector 310. Further, the ML stack 330 is on top and in contact with the inner capping layer 320. (See, FIG. 3, Nos. 310, 320, and 330.)

In contrast, amended claim 10 recites "[a]n apparatus, the apparatus comprising: a substrate; a first multilayer of films on top of and in contact with the substrate to form a flat top surface by a first deposition process; and a second multilayer of films on top of the first multilayer of films, the second multilayer of films effectuating a Bragg reflector to reflect extreme ultraviolet radiation, the second multilayer of films being deposited with a second deposition process different from the first deposition process, wherein the second deposition process comprises an atomic layer deposition process."

(Emphasis added.)

The Office seems to interpret the ML reflector 310 and the ML stack 330 in Yan '163 as the claimed first and second multilayers. However, the mask in Yan '163 cannot reasonably be construed as the claimed apparatus since the layer that is on top of and in contact with the ML reflector 310 is the inner capping layer 320 and not the ML stack 320.

In addition, the second multilayer (ML Stack 330) is not deposited using an atomic layer deposition process as recited in claim 10.

For at least these reasons, claim 10 is allowable over Yan '163. Claims 11-13 and 17-20 depend from claim 10 and are allowable over Yan '163 for at least the same reasons.

Rejections Under 35 U.S.C. § 103(a)

Claims 10-20 and 27-29 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,489,066 to Mirkanimi ("Mirkanimi") or Yan in view of U.S. Patent No. 6,908,714 to Yan et al. (Yan '714) or U.S. Patent No. 6,905,801 to Liang et al. ("Liang ").

Claim 10 and its dependent claims

The Office concedes that Mirkanimi and Yan '163 "differ from those of the applicant in that the applicant teaches (claim 14) that the second multilayer stack is deposited by *atomic layer deposition*." (See, Office Action Dated May 3rd, 2007 at pg. 5, ll. 1-3." The addition of Yan '714 or Liang fails to alleviate the deficiencies of Mirkanimi and Yan '163.

As correctly identified by the Office, both Yan '714 and Liang teach using atomic layer deposition to deposit absorber layers (See, Yan '714 at col. 3, ll. 35-41; Liang at col. 4, ll. 64-67.) In contrast, claim 10 recites that "the second multilayer of films effectuating a Bragg reflector to reflect extreme ultraviolet radiation, the second multilayer of films being deposited with a second deposition process different from the first deposition process, wherein the second deposition process comprises an atomic layer deposition process."

(Emphasis added.)

While the absorber layers in Yan '714 and Liang absorb light, the claimed second multilayer reflects extreme ultraviolet radiation. Thus, the deposition process for the absorber layer in Yan '714 and Liang merely provides for the resultant structure of the absorber layer and not the claimed second multilayer that reflects EUV radiation. Thus, even if Yan '163 or Mirkanimi could somehow be combined with either Yan '714 or Liang, which is not conceded, the hypothetical combination would still fail to teach or suggest each and every feature of claim 10. Namely, the claimed structure of the second multilayer would not be generated.

This is not surprising since atomic layer deposition process is not generally used to deposit reflective layers. As described in Applicant's Specification, "unlike ion beam deposition, atomic layer deposition may tend to conformally coat a surface and may not tend to smooth or planarize substrate defects." (See, Applicant's Specification at pg. 4, ll. 16-18.) In the present application, because the first multilayer is deposited using ion-beam deposition process to smooth the surface defects, the atomic layer deposition process can be used to deposit the second multilayer without risking defect enhancement due to the highly conformal coating process of atomic layer deposition.

The fact that Yan '714 and Liang both teach using atomic layer deposition to deposit absorber layers and not reflective layers supports the argument that Yan '714 and Liang cannot be combined with Yan '163 and Liang '714. Further, since atomic layer deposition is taught by both Yan '714 and Liang for depositing absorber only, the use of atomic layer deposition in Yan '163 or Mirkanimi to deposit a reflective layer is non-obvious and contradicts the teachings of Yan '163 and Mirkanimi.

For at least these reasons, claim 10 is allowable over the proposed combinations. Claims 11-20 depend from claim 1 and are allowable for at least reasons similar to claim 10.

Claims 27 and its dependent claims

Claim 27 is allowable over the proposed combinations for at least reasons similar to claim 10. Claims 28-29 depend from claim 27 and are allowable for at least the same reasons.

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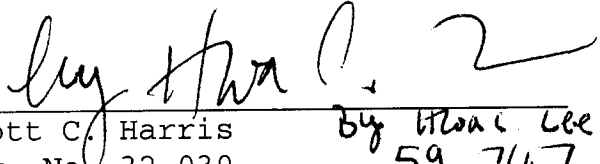
CONCLUSION

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific issue or comment does not signify agreement with or concession of that issue or comment. Because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment. A formal notice of allowance is respectfully requested.

No fees are believed due. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

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